Magnetic Reconnection and Anomalous Cosmic Rays

***Objective*: Complete understanding of reconnection: how magnetic fields change topology and convert magnetic energy to kinetic and thermal energy.**

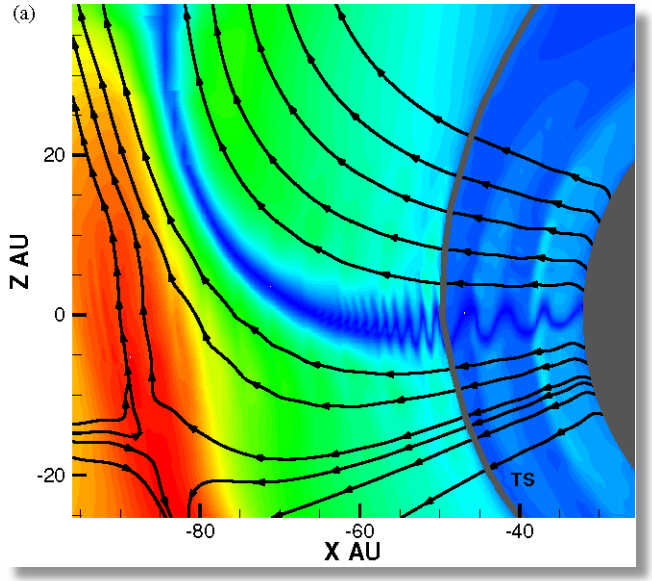
***Implications*: Has broad importance in space (e.g. solar flares), astrophysics, and fusion experiment plasmas.**

***Accomplishments:* Provided explanation for surprising *Voyager 1* & *2* spacecraft observation of Anomalous Cosmic Rays (ACRs: ions with energies just below galactic cosmic rays).**

- **Required both magnetohydrodynamic (MHD) and particle-in-cell (PIC) methods.**
- **Drake is 2010 winner of APS Maxwell Award for Plasma Physics.**

- ***NERSC:* Simulations use 1,024-8,192 cores (Franklin).**

J. F. Drake, et al. (U. Maryland)



2-D view of the magnetic field and flow streamlines from a high-resolution, 3-dimensional MHD simulation of the interaction of the solar wind with the interstellar medium, interplanetary and interstellar magnetic field, and ionized and neutral H atoms.

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